USSR

UDC 621.396.67

SEMENOV, V.S., FRUMKIS, L.S., SHOSTAK, A.S. [Siberian Physicotechnical Institute at the Tomsk State University]

"The Influence Of A Plane-Stratified Medium On The Impedance Of Horizontal Linear Antennas"

Izv. VUZ: Radiofizika, Vol XV, No 5, May 72, pp 773-777

Abstract: Expressions are found for the self impedance of a linear antenna and the mutual impedance of two linear antennas located parallel to the boundary surface of a plane-stratified medium. It is convenient with the use of the recurrence relations given in the paper to calculate with the aid of a computer the antenna impedance for an arbitrary number of layers. The results are shown of calculations of one and two half-wave antennas. Two graphs are presented of the dependence of the components of the impedance introduced into an antenna by a uniform half-space from a height h/λ (λ = length of wave in free space). The values of the dielectric constant ϵ and losses $\eta = 60\sigma\lambda$ correspond to the electromagnetic parameters of the earth in the ultrashort wave band. A graph is shown of the dependence of the active and reactive components of the mutual resistance of antennas located above a uniform half-space on the distance between the antennas. The case of free space ($h = \infty$) is given for comparison. The results are shown in two graphs of the impedance introduced into an antenna by a uniform half-space ($\epsilon = 10$, $\eta = 0.1$) and a passive antenna. 6 fig. 1 ref. Received by editors, 19 August 1971.

1/1

USSR

UDC 546(83-882)261:548.55

FUNKE, V. F., PSHENICHNYY, I. V., KRUGLOV, V. N., and KHARKHARDIN, YE. D.

"Substructure and Nature of the Destruction of Zirconium and Niobium Single Crystals"

Moscow, Neorganicheskiye Materialy, Vol 9, No 12, 1973, pp 2151-2155

Abstract: Results are presented from a study of the substructure, brittleness, plasticity, and microhardness relative to the crystalline characteristics of ZrC and NbC single crystals at room temperature. Analyses were made using selective etching and micro-x-ray techniques; analytical procedures are given for each parameter. These crystals are anisotropic with regards to brittleness, plasticity, and microhardness. The planes of maximum and minimum values are given. The dgree of brittleness is relative to the orientation of the basal layers and increases in the order (111), (110), and (100). NbC is characterized by a higher degree of plasticity and a smaller degree of anisotropy in the rigidity among the crystallographic surfaces than for the ZrC.

1/1

1/2 038 UNCLASSIFIED PROCESSING DATE--13NOV70

TITLE--DEVICE FOR STUDYING PHOTOGRAPHIC PROPERTIES OF PHOTOPOLYMERIC LAYERS -U-

AUTHOR-(05)-FRUNZE, N.K., YASHIN, V.P., BRAZHNIKOV, YE.M., RUSSIYAN, YE.K., SEMENOVAZHUKOVA, M.P.

F

COUNTRY OF INFO--USSR

SOURCE--ZH. NAUCH. PRIKL. FOTOGR. KINEMATOGR. 1970, 15(2), 143-5

DATE PUBLISHED--------70

SUBJECT AREAS--MATERIALS, METHODS AND EQUIPMENT

TOPIC TAGS--POLYMER, POLYPROPYLENE, PLASTIC FILM, UV RADIATION, POLYACRYLATE RESIN, ACETATE, PHOTOGRAPHIC PROPERTY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1995/1423 STEP NO--UR/0077/70/015/002/0143/0145

CIRC ACCESSION NO--AP0116870

UNCLASSIFIED

2/2 038 UNCLASSIFIED PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AP0116870

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. AN APP. WAS DESIGNED FOR DETG. THE SENSITOMETRIC CHARACTERISTICS OF PHOTOPOLYMERS. THE SAMPLE WAS PLACED BETWEEN THE BASE OF A FRAME AND AN ELASTIC TRANSPARENT FILM MADE OF POLYPROPYLENE. THE SPACE BETWEEN THE FRAME AND THE FILM WAS EVACUATED SO THAT THE FILM WAS TIGHTLY PRESSED TO THE SAMPLE AND THE SAMPLE TO THE BASE OF THE FRAME THAT WAS THERMOSTATED. A PARALLEL UV RADIATION BEAM OF DIAM. 100 MM WAS USED SO THAT 70 TIMES 70 MM SAMPLES COULD BE TESTED. POLYACRYLATES WERE EXAMD. BY COATING THEM ON A TRANSPARENT TRIACETATE SUBSTRATE TO A THICKNESS OF 50 MU. FACILITY: INST. KHIM. FIZ., MOSCOW, USSR.

UNCLASSIFIED

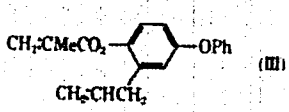
Acc. Nr: AP0100259 Abstracting Service: CHEMICAL ABST. 5/70 Ref. Code: 4/P0062

111139h Preparation of 9,9-bis(4-hydroxyphenyl)fluorene dimethacrylate—a new compound in a series of dimethacrylic esters of bisphenols. Frunze, T. M.; Sakharova, A. A.; Zhirova, L. V. (Inst. Elementoorg. Soedin., Moscow, USSR). *Izv. Akad. Nauk SSSR, Ser. Khim.* 1970, (1), 183–4 (Russ). To 12 g NaOH in 60 ml H_2O was added at 1–5° 35 g 9,9-bis(*p*-hydroxyphenyl)fluorene, followed by 31.4 g CH_2:CMeCOCl to yield after 3 hr 50% 9,9-bis(*p*-methacryloyloxyphenyl)fluorene, m. 201–3°. G. M. Kosolapoff

REEL/FRAME
19841655

Acc. Nr. AP0100237 Abstracting Service: CHEMICAL ABST. 6-70 Ref. Code UR0062

111844j **New mono- and difunctional monomers for polymerization.** Frunze, T. M.; Sakharova, A. A.; Lyubimskaya, R. A.; Ponkratova, T. M. (Inst. Elementoorg. Soedin., Moscow, USSR). *Izv. Akad. Nauk SSSR, Ser. Khim.* 1970, (1), 182-3 (Russ). The condensation of 4-$PhOC_6H_4OH$ with CH_2:$CHCH_2Br$ in acetone contg. K_2CO_3 gave 80% 4-$PhOC_6H_4OCH_2CH$:CH_2 (I), b_1 163-5°. Claisen rearrangement of I at 220° gave 75% 4,3-$HO(CH_2$:$CHCH_2)C_6H_3OPh$ (II), b_6 185-8°. Esterification of II



(III)

with H_2C:$CMeCOCl$ in NaOH soln. gave 70% III, d^{20} 1.1069, n_D^{20} 1.5484.

CPJR

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REEL/FRAME
19841627

766

1/2 025 UNCLASSIFIED PROCESSING DATE--02OCT70

TITLE--ANIONIC POLYMERIZATION OF EPSILON CAPROLACTAM IN THE PRESENCE OF ACTIVATORS WITH UNSATURATED GROUPS -U-

AUTHOR-(05)-KORSHAK, V.V., FRUNZE, T.M., ZAITSEV, V.I., KURASHEV, V.V., BABCHINITSER, T.M.

COUNTRY OF INFO--USSR

F

SOURCE--VYSOKOMOL. SOEDIN., SER. A 1970, 12(2) 416-23

DATE PUBLISHED-------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--POLYMERIZATION, CAPROLACTAM, SODIUM, POLYMER

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1992/0324 STEP NO--UR/0459/70/012/002/0416/0423

CIRC ACCESSION NO--AP0111518

UNCLASSIFIED

2/2 025 UNCLASSIFIED PROCESSING DATE--02OCT70

CIRC ACCESSION NO--AP0111518

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE POLYMN. OF EPSILON CAPROLACTAM (I) IN THE PRESENCE OF NA IS ACCELERATED BY N,METHACRYLOYL, EPSILON,CAPROLACTAM (II) AND H SUB2 C:CHCONPH SUB2 (III). THE PROPERTIES OF POLY,EPSILON,CAPROLACTAM DEPEND ON THE AMT. OF II OR III USED. VERY SATISFACTORY POLYMER BLOCKS WERE OBTAINED WHEN 0.35-1.00 MOLE PERCENT II OR 0.50-2.00 MOLE PERCENT III WERE ADDED TO I TOGETHER WITH 1 EQUIV. (WITH RESPECT TO II OR III) NA. LARGER OR SMALLER AMTS. OF II OR III GAVE BLOCKS WITH SURFACE CRACKS. THE INCREASE IN THE AMT. OF II OR III INCREASES THE INSOLY. OF THE POLYMER IN HCONME SUB2. THIS IS DUE TO THE PARTIAL COPOLYMN. OF I WITH II OR III. THE MECHANISM OF ACCELERATION OF POLYMN. BY II OR III INVOLVES FORMATION OF POLYMERIC ACTIVATOR MOLS., SUCH AS IV.

UNCLASSIFIED

1/2 027 UNCLASSIFIED PROCESSING DATE--02OCT70

TITLE--COPOLYMERIZATION OF STYRENE WITH DIKETENE -U-

AUTHOR-(04)-FRUNZE, T.N., SURIKOVA, M.A., KURASHEV, V.V., KOMAROVA, L.I.

COUNTRY OF INFO--USSR

SOURCE--VYSOKOMOL. SOEDIN., SER. A 1970, 12(2) 460-6

DATE PUBLISHED-------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--COPOLYMERIZATION, STYRENE, KETONE, BENZOYL PEROXIDE, NITRILE, IR SPECTRUM, HETEROCYCLIC OXYGEN COMPOUND

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1992/0325 STEP NO--UR/0459/70/012/002/0460/0466

CIRC ACCESSION NO--AP0111519

UNCLASSIFIED

2/2 027 UNCLASSIFIED PROCESSING DATE--02OCT70

CIRC ACCESSION NO--AP0111519

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. STYRENE (I) WAS POLYMD WITH DIKETENE (II) IN THE PRESENCE OF BZ SUB2 O SUB2 OR AZOBISISOBUTYRONITRILE. IR SPECTROSCOPY OF THE COPOLYMERS, PRODUCED IN YIELDS OF SMALLER THAN OR EQUAL TO 89PERCENT, SHOWED THAT UNITS OF STRUCTURE -CH SUB2 CHPH-, -CME:CHCO SUB2-, -C(:CH SUB2)CH SUB2 CO SUB2-, AND III ARE PRESENT. THE REACTIVITY RATIOS R SUB1 FOR I AND R SUB2 FOR II ARE 100 AND 0.008, RESP.

USSR

UDC 518:517.944/.947

SAMARSKIY, A. A., FRYAZINOV, I. V., Moscow

"On the Convergence of Locally Homogeneous Schemes for the Solution of a Multidimensional Heat Conductivity Equation on Nonuniform Grids"

Moscow, Zhurnal Vychislitel'noy Matematiki i Matematicheskoy Fiziki, No. 3, May/Jun 71, pp 642-657

Abstract: The problem of the convergence of a locally homogeneous scheme for the solution of the first boundary value problem in an arbitrary region and the second and third boundary value problems in stepped regions for a heat conductivity equation not containing mixed derivatives on a sequence of nonuniform grids is discussed. It is established that the convergence of these schemes in a grid norm C on a sequence of nonuniform grids is at the rate $O(h^2 \ln(V_0/H_*) + \tau)$;

where τ is the step of the grid with respect to time, V_0 is the volume of the region $\bar{G}$, and h is the maximum step of the three-dimensional lattice (grid) R^h_p:

$$h = \max_{x_i \in \bar{G}} \max_{1 \leqslant \alpha \leqslant p} h_\alpha(x_i),$$

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SAMARSKIY, A. A., FRYAZINOV, I. V., Zhurnal vychislitel'noy matematiki i matematicheskoy fiziki, No. 3, May/Jun 71, pp 642-657

where $h_\alpha(x_i)$ is the average step of the grid R^h_p at the node x_i in the direction of the coordinate axis ox_α ($\alpha = 1, 2, \ldots, p$, where p is the number of measurements); H_* is the minimum volume of the mesh

$$H_* = \min_{x_i \in \overline{G}} H(x_i), \qquad H(x_i) = \prod_{\alpha=1}^{p} h_\alpha(x_i).$$

The maximum principle and the method of energy inequalities, which make it possible to obtain an evaluation of the solution of the difference problem in the grid norm L_{2n}, where n is an integer, are used to evaluate the rate of convergence of the scheme on a nonuniform grid. Convergence in the grid norm C follows from this evaluation. Negative operators are used as difference operators for any nonuniform grid in an arbitrary region.

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1/2 006 UNCLASSIFIED PROCESSING DATE--11SEP70
TITLE--IMPROVEMENT IN THE TECHNOLOGY FOR PRODUCING CONSTRUCTION ASPHALT
BN,IV -U-
AUTHOR--AKHMETOVA, R.S., FRYGINA, I.G., FRYAZINOV, V.V.

COUNTRY OF INFO--USSR

SOURCE--NEFTEPERERAB. NEFTEKHIM. (MOSCOW) 1970, (1), 9-10

DATE PUBLISHED--------70

SUBJECT AREAS--MATERIALS

TOPIC TAGS--CONSTRUCTION MATERIAL, INDUSTRIAL PRODUCTION, ASPHALT/(U)BNIV ASPHALT

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1990/0793 STEP NO--UR/0318/70/000/001/0009/0010

CIRC ACCESSION NO--AP0108994
UNCLASSIFIED

2/2 006 UNCLASSIFIED PROCESSING DATE--11SEP70

CIRC ACCESSION NO--AP0108994

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. PETROLEUM RESIDUE OBTAINED BY DISTN. IN VACUO YIELDED ASPHALT OF POOR QUALITY. BY OXIDIZING THE RESIDUE UNTIL A SOFTENING POINT (RING AND BALL) 80-100DEGREES WAS REACHED AND DILG. WITH AN EXT. FROM SELECTIVE REFINING OR WITH A VACUUM FRACTION, THE ASPHALT OBTAINED HAD THE REQUIRED PENETRATION. THE CHARACTERISTICS OF THE RAW MATERIALS AND PRODUCTS ARE TABULATED.

zzzzzzzzzzz UNCLASSIFIED

1/2 C06 UNCLASSIFIED PROCESSING DATE--11SEP70
TITLE--IMPROVEMENT IN THE TECHNOLOGY FOR PRODUCING CONSTRUCTION ASPHALT BN,IV -U-
AUTHOR--AKHMETOVA, R.S., FRYGINA, I.G., FRYAZINOV, V.V.

COUNTRY OF INFO--USSR

SOURCE--NEFTEPERERAB. NEFTEKHIM. (MOSCOW) 1970, (1), 9-10

DATE PUBLISHED-------70

SUBJECT AREAS--MATERIALS

TOPIC TAGS--CONSTRUCTION MATERIAL, INDUSTRIAL PRODUCTION, ASPHALT/(U)BN IV ASPHALT

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1990/0793 STEP NO--UR/0318/70/000/001/0009/0010

CIRC ACCESSION NO--AP0108994
UNCLASSIFIED

2/2 006 UNCLASSIFIED PROCESSING DATE--11SEP70
CIRC ACCESSION NO--AP0108994
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. PETROLEUM RESIDUE OBTAINED BY DISTN. IN VACUO YIELDED ASPHALT OF POOR QUALITY. BY OXIDIZING THE RESIDUE UNTIL A SOFTENING POINT (RING AND BALL) 80-100DEGREES WAS REACHED AND DILG. WITH AN EXT. FROM SELECTIVE REFINING OR WITH A VACUUM FRACTION, THE ASPHALT OBTAINED HAD THE REQUIRED PENETRATION. THE CHARACTERISTICS OF THE RAW MATERIALS AND PRODUCTS ARE TABULATED.

ZZZZZZZZZZZZ UNCLASSIFIED

USSR UDC 612:576.2

FUAD, KH. M., and YAGUZHINSKIY, L. S.

"Analysis of the Inhibitory Action of N,N-di-(2-ethyl chloride)-R-amino-phenylacetic Acid and Cinnamic Acid on Phosphorylating Mitochondria"

Moscow, Biologicheskiye Nauki, No 10, 1971, pp 44-47

Abstract: Tests performed on rat liver mitochondria revealed that the alkylating agent N,N-di(2-ethyl chloride)-R-aminophenylacetic acid and cinnamic acid are inhibitors, since they both suppress the respiration and the ATPase activity of mitochondria. However, each acts at a different point of the mitochondrial enzyme system. It is therefore inferred that the mechanism coupling respiration with phosphorylation is regulated by two different enzymes, each of which is indispensable for the normal functioning of the electron transfer chain and of ATP synthesis.

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USSR

UDC 612.014-576.3

FUDEL'-OSYPOVA, S. I., RODIONOV, G. O., and SOKUR, A. I., Laboratory of Physiology, Pathological Morphology and Histochemistry, All Union Institute of Hygiene and Toxicology of Pesticides, Polymers, and Plastics, Kiev

"Sodium and Potassium Permeability of Muscle Fiber Membrane in Warm-Blooded Animals"

Kiev, Fiziologicheskiy Zhurnal, No 5, 1972, pp 654-660

Abstract: In acute experiments with rats, DDT (1/2 LD_{50}) altered both the electrolyte composition of the blood and the potassium-sodium ratio in striated muscle. It increased the content of potassium ions in the muscle fibers by 34.9% while reducing the content of sodium ions by 21.3%. Histochemical examination of muscle preparations revealed an increase in in ATP-ase activity. DDT apparently stimulates the transport of potassium and sodium ions in muscle cells. The authors hypothesize the existence of two separate channels to transport them across the membranes.

1/1

USSR

FUDIM, Ye. V., GOLOD, A. L., CHAYKO, A. L., and SLOBODKIN, V. M.

"Pneumatic Computing Device"

Moscow, Otkrytiya, izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, No 27, 1972, p 163, No (11) 351220

Translation: This device contains an input converter in the form of a pulsating resistance, the output of which is connected to the input of a gas flow integrator. For the sake of accuracy and structural simplicity, the device contains a block for removing the constant portion of the gas flow. The control channel of the gas is connected to the output of the device, the input channel is connected to the integrator input, and the output is connected to a constant pressure source.

1/1

USSR

UDC 669.25'85/.86:669.017.3

ZAKHAROVA, M. I., and FUENTES, KH., Moscow Stated University imeni M. V. Lomonosov

"Structure and Phase Composition of $Pr(Co, Cu)_5$, $Pr(Co, Cu, Fe)_5$, and $Pr(Co, Ni)_5$ Alloys"

Sverdlovsk, Fizika Metallov i Metallovedeniye, Vol 36, No 3, 1973, pp 662-664

Abstract: A study was made of $Pr(Co, Cu)_5$ and $Pr(Co, Cu, Fe)_5$ alloys as to their phase composition and structure using methods of x-ray diffraction, optical microscopy, microhardness measurement, and local x-ray spectral analysis. The investigated alloys $PrCo_{3.5}Cu_{1.5}$, $PrCo_{2.5}$, and $PrCo_{3.5}Cu_{1.0}Fe_{0.5}$ were melted in an arc furnace and homogenized in evacuated quartz tubes at 110°C with subsequent water quenching. It was found that the Pr-Co-Cu alloys have a region of solid solutions with compositions that deviated from stoichiometric. Pr-Co-Cu alloys with iron consist of two phases with varying Co, Cu, and Fe contents. A study of the possibility of replacing cobalt with nickel was made on an alloy of $PrCo_{3.5}Ni_{1.5}$. After

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USSR

ZAKHAROVA, M. I., and FUENTES, KH., et al., Fizika Metallov i Metallovedeniye, Vol 36, No 3, 1973, pp 662-664

homogenization at 1100°C for six hours the alloy was found to be a single-phase alloy and the structure did not change even after tempering 150 hours at 400 and 100 hours at 550°C. Consequently, phase transformations do not take place in this alloy at temperatures below 1100°C. The authors thank G. N. Romani who performed the local x-ray spectral analysis. Four figures, six bibliographic references.

2/2

USSR

UDC 681.327.2

TSVETAYE, V. K.P., ANTONOV, V. N., KONDRAT'YEV, P. P., SHISHKIN, A. M., and FUFLYGIN, G. I., Moscow Power Institute

"Recording Device"

USSR Author's Certificate No 372557, kl G 06 f 3/14, filed 4 Jul 69, published 25 Apr 73 (from RZh Avtomatika Telemekhanika i Vychislitel'naya Tekhnika, No 11, Nov 73, abstract No 11, A431P)

Translation: A device is proposed for recording, containing the following units arranged sequentially along one optical axis: a light source, system of controlling the light beam containing sequentially arranged polarizers, crystal blocks with controllable planes of polarization and an analyzer, an optical system, and an information carrier. To improve the speed, the crystals of the light beam control system contain openings corresponding to the shapes of the symbols to be recorded. Two illustrations.

1/1

Rolling Steel

UDC 669.15669.017.25539.4

EFFECT OF WARM ROLLING ON THE MECHANICAL PROPERTIES OF UNSTABLE CHROMIUM-MANGANESE AUSTENITIC STEEL

[Article by I. N. Bogachev, T. D. Eysmondt, A. V. Fugman, Ural Polytechnic Institute imeni S. M. Kirov, Moscow, Fizika metallov i metallovedenire, Russian, Vol 34, No 5, 1962, submitted 8 October 1971, pp 1034-1041]

A study was made of the possibility of increasing the set of mechanical properties of unstable chromium-manganese austenitic steel by deformation in the 300-500° C range. Along with an increase in the strength properties, the warm rolling leads to an increase in the plastic properties of the steel with active development of martensitic conversion with deformation. This is connected with stabilization of the austenite with respect to phase transformations. After warm rolling the amount of alpha-phase in the test process increases gradually with an increase in the degree of deformation which insures good plasticity of these steels.

Warm deformation is widely used for strengthening austenitic steel [1-3]. The majority of studies in this area have been made on chromium-nickel steel. In this paper a study has been made of the effect of warm rolling in the temperature range of 300-550° on the mechanical properties of unstable austenitic chromium-manganese steel. The level of the mechanical properties (σ_B, δ) of the unstable austenitic steels depends to a high degree on the intensity of development of the martensitic conversion during testing. Accordingly, a study is made of the effect of the temperature and degree of preliminary deformation on the development of the martensitic $\gamma \to \varepsilon \to \alpha$ transformations with subsequent deformation.

Experimental Data and Procedure

A study is made of the steel having different stability of the austenite, the content of carbon and the content of the carbide-forming element -- chromium (Table 1).

FUGMAN, A.V.

Table 1

Type of steel	C	Cr	Mn	Si	S	P
30Kh2G10	0,30	2,30	10,55	0,38	—	—
30Kh16G10	0,32	16,20	10,36	0,14	0,0001	0,0001
47Kh10G8	0,47	9,61	7,60	0,35	—	—
60G7	0,60	0,19	6,81	0,40	—	—
20Kh10G10	0,20	11,00	10,10	0,35	0,015	0,015

The steel was made in an induction furnace. After homogenizing annealing, the ingots weighing 8 kg were forged into bars which went through the austenizing stage at 1,100° with subsequent cooling in water. The deformation was realized by rolling on a roll pass mill in the 300-550° range. The heating of the specimens to the deformation temperature and heating them during rolling took place in a salt bath. The billets 10 x 10 mm in cross section were rolled, then specimens were made from them for mechanical testing.

The effect of the temperature and degree of preliminary deformation on the development of the [illegible] transformations during subsequent deformation was studied on a 20Kh10G10 steel wire. The deformation was realized by twisting.

The amount of α-phase formed during deformation was determined using the Shteynberg-Zyuzin ballistic magnetometer. An armco iron sample was used as the standard. The effect of the alloying elements on the magnetic saturation of the investigated steel was considered for the calculation. The relative ε-phase content was estimated by varying the density Δρ/ρ as a result of the ε→α transformation [4]. The mechanical properties were determined using specimens 3 mm in diameter and with l_0 = 20 mm on the IM-4R machine.

Results and Discussion of the Results

The amount of α-martensite formed in the steel during plastic flow by torsion is illustrated in Figure 1. For steel with 0.3 percent C (30Kh2G10 and 30Kh16G10) an increase in the chromium content leads to stabilization of the austenite with respect to γ→α conversion during deformation. Thus, after 15 percent deformation in 30Kh2G10 steel, 29 percent α-phase is formed; in 30Kh16G10 steel, 1 percent. Torsion fracture of 30Kh2G10 steel with intense formation of deformation martensite takes place at 17 percent deformation; for 30Kh16G10 steel in which the amount of α-phase gradually increases with an increase in the degree of deformation it takes place at 40 percent. The mechanical properties of this steel after quenching and preliminary warm rolling are presented in Table 2.

The increase in chromium content in steel with 0.3 percent C somewhat exceeds the yield point of $\sigma_{0.2}$ after quenching (from 41 to 46.2 kg/mm^2); the ultimate strength σ_B increases sharply in this case: from 57.7 kg/mm^2 for 30Kh2G10 steel to 97.1 kg/mm^2 for 30Kh16G10 steel. The formation of a large amount of deformation martensite in the first steel during mechanical testing

USSR

UDC: 669.15-198-154:541.13

FUGMAN, G. I., SOTNIKOV, A. I., YESIN, O. A., and BARMIN, L. N., Ural Polytechnic Institute

"Rate of Ion Exchange Between Liquid Ferrotitanium and an Oxide Melt"

Moscow, Izvestiya Vysshikh Uchebnykh Zavedeniy, Chernaya Metallurgiya, No 4, 1973, pp 9-12

Abstract: The authors study the use of the Faraday impedance method for finding the kinetic parameters of the oxidation-reduction processes taking place between metal and slag under retarded relaxation conditions of a double electric layer. It is shown that the use of standard methods for processing experimental data can result in significant error. Methodology is proposed for determining the exchange current (i_o) by analyzing the active component of the electrode impedance. The methodology is used in analyzing the results of the measurements in the ferrotitanium-slag system. The concentration relationship i_o of titanium is studied for the 1450-1550°C interval at 3-16 percent titanium in the metal and 0.5-5.0 percent TiO_2 in the slag. A kinetics equation is proposed for calculating i_o.

USSR

UDC: 533.9.082.5

FUGOL', I. Ya., MYSHKIS, D. A., and GRIGORASHCHENKO, O. N.

"Absorption Methods of Measuring Absolute Concentration of Metastable Helium Atoms in a Plasma"

Leningrad, Optika i Spektroskopiya, vol. 31, No. 4, 1971, pp 529-535

Abstract: An important factor in the determination of the kinetics of metastable helium atoms is the measurement of the integral absorption of the radiation from an external source passing through the plasma. This paper computes the full absorption and reabsorption of the 388.9 nm line and the singlet 501.6 nm line for the 4-300° K and the 1-70 mm Hg temperature and pressure intervals respectively. The asymptotes in the limiting cases of small and large optical densities are analyzed. The results of these computations permit obtaining the absolute concentration of the helium metastable atoms in the 2^3S and 2^1S states. The authors note that details of the computations are given in their preliminary papers published in the Trudy FTINT, No. 1, 1968, p 204 and No. 5, 1969, p 50. Curves are plotted for the integral absorption as a function of the optical thickness for He 388.9 nm and for the absorption as a function of the optical thickness for the He 501.6 nm line. The authors thank L. A. Temkin for

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FUCOL', I. Ya. et al, Optika i spektroskopiya, vol. 31, No. 4, 1971, pp 529-535

setting up the program and making the computations on the electronic computer.

2/2

UDC 546.26-162:541.183

USSR

VASIL'YEV, YU. N., and FUGOL', V. A.

"Adsorption of Phosphoric Anhydride on Graphite at 300° C"

Moscow, Neorganicheskiye Materialy, Vol 10, No 1, Jan 74, p 162

Abstract: The magnitude of phosphoric anhydride adsorption was measured on graphite AG-1500 at 300° C in relation to phosphoric anhydride partial pressure in the gas phase. The graphite was placed in a crucible which was suspended in a quartz vessel containing phosphoric anhydride. The vessel had a one-millimeter opening through which the steel wire supporting the crucible passed and had a ratio of vessel to opening diameter which would provide the required phosphoric anhydride partial pressure which was equal to the pressure of the anhydride vapors at the coolest part of the vessel. Two electric heaters were used -- the top heater maintained the graphite at 300° C while the bottom heater created the temperature to the required magnitude of partial pressure. The upper end of the steel wire was fastened to the beam of an analytical balance. Prior to measuring adsorption, the graphite was heated to 300° C by the top heating element to a constant weight (5 g); then the botton heater was

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VASIL'YEV, YU. N., and FUGOL', V. A., Neorganicheskiye Materialy, Vol 10, No 1, Jan 74, p 162

switched on and graphite weight measured every 30-40 minutes until a constant weight was achieved. It was noted that there was a sharp rise in the absorption curve at values of lg P/P_S = -1.5 which gave evidence of the start of two dimensional condensation. One figure, three bibliographic references.

2/2

Graphite

UDC 621.893

USSR

VASIL'YEV, YU. N., Candidate of Chemical Sciences, and YEMEL'YANOVA, V. M., and FUGOL', V. A., Candidates of Technical Sciences

"Antifriction Graphite Material"

Moscow, Mashinostroitel', No 2, Feb 74, p 42

Abstract: A new antifriction graphite material ATG, being produced in experimental batches, has been designated for use in friction assemblies operating at temperatures up to 650° C. It contains special compounds that increase its wear resistance at room temperature by approximately 10 times and insure a good lubricating capability at temperatures up to 650° C. Seals made of ATG, 1000-mm diameter, worked for more than 500 hours at 600° C, 4-kgf/cm^2 load, and 1-m/sec slip rate, and preserved their efficiency. The same was true for ATG piston rings after 100 hours at 600-650° C and a pressure of 3-5 kgf.cm^2.

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USSR

UDC 546.26-162:541.183:539.62

VASIL'YEV, YU. N., and FUGOL', V. A.

"Effect of Phosphoric Anhydride Adsorption on Graphite Friction and Wear"

Moscow, Neorganicheskiye Materialy, Vol 10, No 1, Jan 74, pp 159-161

Abstract: A study was made to explain the phenomenon of the lubricating properties of graphite. The hypothesis was made that, upon heating, phosphates decompose with the liberation of phosphoric anhydride which is adsorbed on the graphite and preserves its lubricating qualities at 300-600° C where the adsorption of water vapors on graphite is not possible. Another goal was to find a means of increasing the wear resistance of antifriction graphite. Antifriction graphite grade AG-1500, produced by electrode technology at 2500° C from petroleum coke, coal coke, and natural coke, was used. Graphs from produced data showed that the coefficient of friction was low for a 1-20% degree of coating with the corresponding rate of wear increasing starting with about a 20% degree of coating when the graphite surface was coated with molecules of phosphoric anhydride and tested at 300° C. The relationship of friction coefficient and wear rate (for a constant load of 5 kG/mm^2) to partial pressure of phosphoric anhydride vapors rises sharply when the partial pressure exceeds 1 mm Hg. From mathematical treatment of the experiment the authors

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USSR

VASIL'YEV, YU. N., and FUGOL', V. A., Neorganicheskiye Materialy, Vol 10, No 1, Jan 74, pp 159-161

were able to determine the magnitude of the two-dimensional gas pressure which was numerically equal to lowering surface energy. This value was on the order of 50 dyne/cm. It was concluded that a partial pressure of phosphoric anhydride of about 1.5 mm Hg makes it possible to expand the temperature interval of using antifriction graphite in dry friction from 300 to 600° C. Three figures, nine bibliographic references.

2/2

1/2 028 UNCLASSIFIED PROCESSING DATE--30OCT7

TITLE--CYTOCHEMICAL INVESTIGATION OF LYMPHOID TISSUE IN THE CASE OF CHRONIC LYMPHATIC LEUCOSIS IN MAN -U-

AUTHOR-(04)-KOGARKO, I.N., KOGARKO, B.S., YEVSEYENKO, L.S., FUKS, B.B.

F

COUNTRY OF INFO--USSR

SOURCE--IZVESTIYA AKADEMII NAUK SSSR, SERIYA BIOLOGICHESKAYA, 1970, NR 6, PP 348-355

DATE PUBLISHED--------70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--LYMPHOID TISSUE, RNA, DNA, AUTORADIOGRAPHY, LEUKOCYTOSIS

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3001/1377 STEP NO--UR/0216/70/000/006/0348/0355

CIRC ACCESSION NO--AP0126921

UNCLASSIFIED

2/2 028 UNCLASSIFIED PROCESSING DATE--30OCT7(

CIRC ACCESSION NO--AP0126921

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. CELLS OB BIOPSIZED LYMPHATIC NODES OF 8 HEALTHY PEOPLE AND 6 PATIENTS SUFFERING FORM HUMAN LYMPHATIC LEUCOSIS WERE EXAMINEA. RNA AND DNA BIOSYNTHESIS (AUTORADIOGRAPHY) AS WELL AS DNA CONTENTS (CYTOPHOTOMETRY) WERE DETERMINED IN A SINGULAR CELL. IT WAS SHOWN THAT IN THE COURSE CF THE PROGRESS OF THE DISEASE AN INCREASE IN OBSERVED OF RNA SYNTHESIS SPEED IN MEDIUM AND LARGE LYMPOCYTES AS WELL AS IN BLASTS. AT THE SAME TIME THE NUMBER OF CELLS SYNTHESIZING DNA (FROM 8PERCENT, TO 0.7PERCENT) DROPS DOWN. IN SPITE OF IT THE CELL FRACTION RICH IN DNA BECOMES DEFINITELY INCREASED. THESE CELLS DISPLAY A RELATIVE HIGH RNA SYNTHESIS. APPEARANCE OF A CONSIDERABLE NUMBER OF CELLS WITH A HIGH DNA COMTENTS BUT NO LONGER SYNTHESIZING THE COMPOUND MAY BE A RESULT OF LAGGING DURING THIS PERIOD. THE RELATIVELY HIGH ELVEL OF RNA SYNTHESIS IN SUCH CELLS EVIDENTLY CANNOT BE CONNECTED WITH GENE ACTIVITY CONTROLLING PROLIFERATION. ONE MAY SUGGEST THAT THE OBSERVED PHENOMENA MAY DEPEND ON AN UNUSUAL BREAKAGE OF THE PROLIFERATION MECHANISM IN LYMPHOID CELLS IN THE CASE OF CHRONIC LYMPHOLEUCOSIS. AN ACTIVATION OF SOME GENES OF A MALIGNIZED LYMPHOCYTE BECOMES MOVE EVIDENT ON THIS BACKGROUND. FACILITY: INSTITUTE OF CHEMICAL PHYSICS, ACADEMY OF SCIENCES, USSR.

UNCLASSIFIED

APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R002200820015-1"

USSR

UDC: 8.74

LEONT'YEV, A. G., MOROZOV, A. M., [redacted] B. K.

"A Random Sequence Generator, and a Check on its Quality"

V sb. Peredacha diskretn. soobshch. po kanalam s gruppiruyushchimisya oshibkami (Transmission of Discrete Messages Over Channels With Grouped Errors--collection of works), Moscow, "Nauka", 1972, pp 126-134 (from RZh-Kibernetika, No 6, Jun 72, Abstract No 6V497)

Translation: An explanation is given of a block diagram for a random sequence generator. The complete schematic of the device is given and the interaction between subassemblies is explained. Feedback is introduced to improve accuracy. Algorithms are presented for checking the random sequence generator, and a comparative analysis of the algorithms is given. Authors' abstract.

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USSR

GEL'FAND, I. M., KALININ, D. I., and FUKS, D. B., Moscow State University

"On Cohomologies of a Lie Algebra of Hamiltonian Formal Vector Fields"

Moscow, Funktsional'nyy Analiz i Yego Prilozheniya, Vol 6, No 3, Jul-Sep 72, pp 25-29

Abstract: The article considers the problem of calculating the cohomologies of a Lie algebra of Hamiltonian formal vector fields, which is more difficult to do than to calculate the cohomologies of a Lie algebra of all formal vector fields. Calculations were made on a computer to test the hypothesis that the addition summand is acyclic. The result was that the hypothesis was disproved. The authors found new nontrivial classes of cohomologies of the algebra of Hamiltonian formal vector fields in R^2. An important difference between these classes and the classes of cohomologies found previously by the authors for the algebra of all formal vector fields is that they cannot be represented by cocycles which depend only on the 2-streams of their arguments.

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USSR

GEL'FAND, I. M., and FUKS, D. B., Moscow State University

"Upper Limits for Cohomologies of Infinite-Dimensional Lie Algebras"

Moscow, Funktsional'nyy Analiz i Yego Prilozheniya, Vol 4, No 4, Oct-Dec 70, pp 70-71

Abstract: In a previous article the authors studied cohomologies, with real coefficients, of a Lie algebra of smooth vector-fields on a smooth manifold. The finite-dimensionality of these cohomologies was proved, subject to certain limitations. One of the intermediate assertions concerned the finite-dimensionality of a complete cohomology space of a Lie algebra of formal vector-fields. The purpose of the present article is to formalize and generalize the method used by the authors to prove this assertion.

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USSR UDC 513.83

GEL'FAND, I. M., Corresponding Member of the Academy of Sciences USSR, and FUKS, D. B., Moscow State University imeni M. V. Lomonosov

"Cohomologies of Lie Algebra of Smooth Vector Fields"

Moscow, Doklady Akademii Nauk SSSR, Vol 190, No 6, 1970, pp 1267-1270

Abstract: In a previous article the authors began the study of cohomologies of a Lie topological algebra of smooth vector fields on a connected, compact, orientable smooth manifold. The present article contains several new facts about these cohomologies. The central result is a full description of cohomologies of a Lie algebra on tori of arbitrary dimensionality, as well as on two-dimensional manifolds.

UNCLASSIFIED PROCESSING DATE--20NOV70

1/2 008

TITLE--COHOMOLOGIES OF LIE ALGEBRA OF SMOOTH VECTOR FIELDS -U-

AUTHOR-(02)-GELFAND, I.M., FUKS, D.B.

COUNTRY OF INFO--USSR

SOURCE--MOSCOW, DOKLADY AKADEMII NAUK SSSR, VOL 190, NO 6, 1970, PP 1267-1270

DATE PUBLISHED--------70

SUBJECT AREAS--MATHEMATICAL SCIENCES

TOPIC TAGS--LIE GROUP, ALGEBRAIC GEOMETRY, VECTOR ANALYSIS, MANIFOLD

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1993/0490 STEP NO--UR/0020/70/190/006/1267/1270

CIRC ACCESSION NO--AT0113381

UNCLASSIFIED

2/2 008 UNCLASSIFIED PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AT0113381

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. IN A PREVIOUS ARTICLE THE AUTHORS BEGAN THE STUDY OF COHOMOLOGIES OF A LIE TOPOLOGICAL ALGEBRA OF SMOOTH VECTOR FIELDS ON A CONNECTED, COMPACT, ORIENTABLE SMOOTH MANIFOLD. THE PRESENT ARTICLE CONTAINS SEVERAL NEW FACTS ABOUT THESE COHOMOLOGIES. THE CENTRAL RESULT IS A FULL DESCRIPTION OF COHOMOLOGIES OF A LIE ALGEBRA CN TORI OF ARBITRARY DIMENSIONALITY, AS WELL AS ON TWO DIMENSIONAL MANIFOLDS. FACILITY: MOSCOW STATE UNIVERSITY IMENI M. V. LOMONOSOV.

UNCLASSIFIED

USSR

GEL'FAND, I. M., and FUKS, D. B., Moscow State University

"Cohomologies of Lie Algebras of Tangent Vector Fields of a Smooth Manifold. II"

Moscow, Funktsional'nyy Analiz i Yego Prilozheniya, Vol 4, No 2, Apr/ Jun 70, pp 23-31

Abstract: This article is a continuation of a previous article by the same title in this journal (Vol 3, No 3, 1969, pp 32-52). The first article studied cohomologies of a Lie algebra U(M) of smooth tangent vector fields of a smooth, compact, oriented manifold M with coefficients in a trivial, real representation. The fundamental result of the article was a theorem on the finite dimensionality of these cohomologies in each dimensionality. During the proof a subcomplex $C_1(M) = \{C_1^q(M), d^q\}$ was identified in a standard complex $C(M) = \{C^q(M), d^q\}$ of the Lie algebra U(M) which the authors called "diagonal," the spectral sequence

$$E = \{E_r^{u,v}, \delta_r^{u,v} = E_r^{u,v} \to E_r^{u+r,\ v-r+1}\}$$

convergence to homologies of the diagonal complex was constructed, and an expression was found for its initial (second) term. In the first part of this

USSR

GEL'FAND, I. M., and FUKS, D. B., Funktsional'nyy Analiz i Yego Prilozheniya, Vol 4, No 2, Apr/Jun 70, pp 23-31

article a new interpretation is given to the second term of the spectral sequence E which makes it possible to show in particular the triviality of certain of its differentials. The second part of the article discusses the relationship between the last term of the spectral sequence E (i.e., homologies of the diagonal complex) and cohomologies of the algebra U(M). The most complete information is obtained for the case in which the spectral sequence E is trivial (i.e., when $E_2 = E_\infty$). The results of these sections are used to obtain a description of a ring connected to a ring of cohomologies of the Lie algebra of tangent vector fields for certain manifolds, particularly for toruses of arbitrary dimensionality and for all oriented two-dimensional manifolds.

1/2 019 UNCLASSIFIED PROCESSING DATE--23OCT70

TITLE--ON THE NATURE OF AGGREGATIVE STABILITY OF COLLOIDAL SOLUTIONS. THE CONDITIONS OF THE EXISTENCE OF TWO PHASE DISPERSED SYSTEMS IN

AUTHOR-(03)-BARBOY, V.M., GLAZMAN, YU.M., FUKS, G.I.

COUNTRY OF INFO--USSR

SOURCE--KOLLOIDNYY ZHURNAL, 1970, VOL 32, NR 3, PP 321-326

DATE PUBLISHED--------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--COLLOID, CHEMICAL STABILITY, THERMODYNAMICS

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1998/0189 STEP NO--UR/0069/70/032/003/0321/0326

CIRC ACCESSION NO--AP0120887

UNCLASSIFIED

2/2 019 UNCLASSIFIED PROCESSING DATE--23OCT70
CIRC ACCESSION NO--AP0120887
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. IT IS DEMONSTRATED THAT TWO PHASE DISPERSED SYSTEMS CAN EXIST IN THERMODYNAMIC EQUILIBRIUM IF THE SPECIFIC SURFACE ENERGY IS SMALL AND INCREASES FAST ENOUGH WITH DECREASING PARTICLE RADIUS. FACILITY: KIEV. TEKHNOLOGICHESKIY INSTITUT LEGKOY PROMYSHLENNOSTI, NIICHASPROM, LABORATORIYA FIZIKO KHIMII POVERKHNOSTI, MOSCOW.

UNCLASSIFIED

1/2 030 UNCLASSIFIED PROCESSING DATE--30OCT70
TITLE--ON THE DIELECTRIC PERMITTIVITY OF THE BOUNDARY LAYERS OF LIQUIDS AND SURFEACTANT SOLUTIONS -U-
AUTHOR-(02)-GANTSEVICH, I.B., FUKS, G.I.

COUNTRY OF INFO--USSR

SOURCE--KOLLOIDNYY ZHURNAL, 1970, VOL 32, NR 2, PP 195-202

DATE PUBLISHED--------70

SUBJECT AREAS--MATERIALS, PHYSICS, CHEMISTRY

TOPIC TAGS--HYDROCARBON, ELECTRICAL CONDUCTIVITY, DIELECTRIC PERMEABILITY, SURFACTANT, BOUNDARY LAYER

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1992/1721 STEP NO--UR/0069/70/032/002/0195/0202

CIRC ACCESSION NO--AP0112715
UNCLASSIFIED

2/2 030 UNCLASSIFIED PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0112715

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A DEVICE IS DESCRIBED FOR MEASURING SIMULTANEOUSLY AND INDEPENDENTLY THE THICKNESS OF THE BOUNDARY LAYER OF NONPOLAR AND LOW POLAR LIQUIDS, ITS DIELECTRIC PERMITTIVITY (DP) AND ELECTRIC RESISTANCE. FOR SUCH LIQUIDS AS DIBUTYLPHTHALATE, STEARIC ACID AND CETYL ALCOHOL SOLUTIONS IN LIQUID HYDROCARBONS AS WELL AS FOR LOW POLAR LUBRICANTS DP IN THE BOUNDARY LAYER IS GREATER THAN IN THE BULK, AND FREQUENCY DISPERSION IS OBSERVED. FOR SOME LIQUIDS THE TEMPERATURES OF THE CHANGE IN THE SIGN OF THE DERIVATIVE DE-DT HAVE BEEN DETERMINED AS WELL AS THE TEMPERATURES OF FORMATION OF SURFACTANT QUASICRYSTALS OR MICELLES. SOME CONSIDERATIONS ARE PRESENTED ON THE STRUCTURE OF THICK BOUNDARY LAYERS OF ALIPHATIC ACIDS AND ALCOHOLS SOLUTIONS IN LIQUID HYDROCARBONS.

UNCLASSIFIED

2/2 020 UNCLASSIFIED PROCESSING DATE--13NOV70
CIRC ACCESSION NO--AP0133791
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE EFFICIENCY OF PH SUB2 NH, AND OXION, INHIBITOR FOR GREASES, WAS NOT AFFECTED BY THE METHOD OF INTRODUCING THE ADDITIVE. THE OPTIMUM CONCN. WAS 0.3-0.6 WT. PERCENT PH SUB2 NH. FACILITY: MOSK. OPYT.-PROM. ZAVOD, MOSCOW, USSR.

UNCLASSIFIED

USSR

SIMAKHIN, V. A., FUKS, I. L.

"One Class of Rank Tests for the Problem of Dependence"

Tr. Sib. fiz.-tekhn. in-ta pri Tomsk. un-te [Works of Siberian Institute of Physics and Technology of Tomsk University], 1973, No 63, pp 196-208 (Translated from Referativnyy Zhurnal - Kibernetika, No 8, 1973, Abstract No 8 V170 by D. Chibisov)

Translation: With the sample $X_1,\ldots,X_n$, hypothesis H_0 and the hypothesis that X_i are independent and identically distributed against the alternative of dependence are tested. A class of criteria is studied, based on

$$S_N = \frac{1}{N-1} \sum_{2 \le i \le N} a_{1N}\left(\frac{R_i}{N+1}\right) a_{2N}\left(\frac{R_{i-1}}{N+1}\right).$$

where R_i is the rank of X_i, $a_{jN}(u)$ converge on the mean square to certain functions $a_j(u)$, u [0,1], $j=1,2$. Asymptotic normality of S_N is proven in the case of an M dependent sequence and with continual alternatives of the Markov dependence. In the last case,, asymptotically optimal criteria are constructed against the fixed alternative. The asymptotic effectiveness of the criteria is studied.

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Acc. Nr: AP0038057 F Ref. Code: UR 0056

PRIMARY SOURCE: Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, 1970, Vol 58, Nr 1, pp 360-368

EFFECTIVE VISCOSITY OF He II IN NARROW CAPILLARY TUBES

I. N. Adamenko, I. M. Fuks

A mechanism of interaction between a phonon gas and an absolutely hard surface is considered. In a number of cases the transition probability for scattering of quasiparticles on the He II — solid body interface is found in explicit form. The effective viscosity in narrow tubes filled with He II is calculated by applying the boundary conditions derived. It is assumed that the tube diameter is much smaller than the mean free path of elementary excitations. The effective viscosity significantly depends on the relation between the phonon wavelength and the characteristic size of roughnesses on the surface.

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19731101

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UDC 621.372.09

V. D. FREYLIKHER and I. M. FUKS

"Attenuation of the Average Field in a Waveguide at the Critical Frequency"

Gor'kiy, Izvestiya, VUZov SSSR Radiofizika, Vol 13, No 1, 1970, pp 128-132

Abstract: This article is principally a mathematical one devoted to the computation of the attenuation of normal waves in a plane waveguide with rough, plane walls, and is a follow-up of an article in Vol 12, No 10, page 1521 (1969) of the same journal, written by the same two authors and F. G. Bass. An equation is given for computing the attenuation caused by noncoherent dispersion, this equation is derived from the Dyson nonlinear equation involving the averaged Green function. Because of the roughness of the waveguide walls, the resonance mode is propagated along the waveguide with an attenuation decrement proportional of the two-thirds power of the roughness parameter. The other characteristic waves are weakened to a lesser extent. It is noted that if the

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USSR

V. D. FREYLIKHER, et al, Izvestiya VUZov SSSR Radiofizika, Vol 13, No 1, 1970, pp 128-132

roughness of the waveguide walls is isotropic, there is practically no dispersion in the resonance mode. The authors also remark that in real, smooth waveguides, there is an additional attenuation connected either with dissipative losses or with "de-excitation" of the radiating field into the medium surrounding the waveguide, such as occurs in acoustical waveguides with the violation of the condition of absolute softness f the boundaries. Their estimates for acoustical waveguides with water-air boundaries (in a submerged sound channel, for example) lead them to conclude that even a slight roughness in the walls may lead to substantial attenuation. They thank F. G. Bass and I. A. Urusovskiy for their useful comments on the paper.

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1/2 029 UNCLASSIFIED PROCESSING DATE--27NOV70
TITLE--ATTENUATION OF THE AVERAGE FIELD IN A WAVEGUIDE AT THE CRITICAL FREQUENCY -U-
AUTHOR-(02)-FREYLIKHER, V.D., FUKS, I.M.

COUNTRY OF INFO--USSR

SOURCE--GOR'KIY IZVESTIYA, VUZOV SSSR RADIOFIZIKA, VO 13, NO 1, 1970, PP 128-132
DATE PUBLISHED-------70

SUBJECT AREAS--ELECTRONICS AND ELECTRICAL ENGR., NAVIGATION

TOPIC TAGS--WAVEGUIDE LOSS, MICROWAVE ATTENUATOR, NONLINEAR EQUATION, GREEN FUNCTION, ELECTROMAGNETIC WAVE RADIATION, ACOUSTIC WAVE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3003/1960 STEP NO--UR/0141/70/013/001/0128/0132

CIRC ACCESSION NO--AP0130740
UNCLASSIFIED

2/2 029 UNCLASSIFIED PROCESSING DATE--27NOV70

CIRC ACCESSION NO--AP0130740

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THIS ARTICLE IS PRINCIPALLY A MATHEMATICAL ONE DEVOTED TO THE COMPUTATION OF THE ATTENUATION OF NORMAL WAVES IN A PLANE WAVEGUIDE WITH ROUGH, PLANE WALLS, AND IS A FOLLOW UP OF AN ARTICLE IN VOL 12, NO 12, PAGE 1521 (1969) OF THE SAME JOURNAL, WRITTEN BY THE SAME TWO AUTHORS AND F. G. BASS. AN EQUATION IS GIVEN FOR COMPUTING THE ATTENUATION CAUSED BY NONCOHERENT DISPERSION, THIS EQUATION IS DERIVED FROM THE DYSON NONLINEAR EQUATION INVOLVING THE AVERAGED GREEN FUNCTION. BECAUSE OF THE ROUGHNESS OF THE WAVEGUIDE WALLS, THE RESONANCE MODE IS PROPAGATED ALONG THE WAVEGUIDE WITH AN ATTENUATION DECREMENT PROPORTIONAL OF THE TWO THIRDS POWER OF THE ROUGHNESS PARAMETER. THE OTHER CHARACTERISTIC WAVES ARE WEAKENED TO A LESSER EXTENT. IT IS NOTED THAT IF THE ROUGHNESS OF THE WAVEGUIDE WALLS IS ISOTROPIC, THERE IS PRACTICALLY NO DISPERSION IN THE RESONANCE MODE. THE AUTHORS ALSO REMARK THAT IN REAL, SMOOTH WAVEGUIDES, THERE IS AN ADDITIONAL ATTENUATION CONNECTED EITHER WITH DISSIPATIVE LOSSES OR WITH "DE EXCITATION" OF THE RADIATING FIELD INTO THE MEDIUM SURROUNDING THE WAVEGUIDE, SUCH AS OCCURS IN ACOUSTICAL WAVEGUIDES WITH THE VIOLATION OF THE CONDITION OF ABSOLUTE SOFTENSS F THE BOUNDARIES. THEIR ESTIMATES FOR ACOUSTICAL WAVEGUIDES WITH WATER AIR BOUNDARIES (IN A SUBMERGED SOUND CHANNEL, FOR EXAMPLE) LEAD THEM TO CONCLUDE THAT EVEN A SLIGHT ROUGHNESS IN THE WALLS MAY LEAD TO SUBSTANTIAL ATTENUATION. THEY THANK F. G. BASS AND I. A. URUSOVSKIY FOR THEIR USEFUL COMMENTS ON THE PAPER.

UNCLASSIFIED

UDC 621.396.96:621.391.84:517.27

USSR

FUKS, L. B.

"Physical Meaning of Linear Filtration of an Echo Against a Background of Random Reflections"

Sb. nauch. tr. Kiev. in-t inzh. grazhd. aviatsii (Collection of Scientific Works of the Kiev Institute of Civil Aviation Engineering), 1971, vyp. 6, pp 33-36 (from RZh-Radiotekhnika, No 6, Jun 72, Abstract No 6G15)

Translation: A study is made of the detection of a stationary concentrated target (adopted for idealization as a point target) against a reflecting background of randomly arranged points in an incoherent pulsed radar system. The bibliography has 7 entries.

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UDC: 621.383.8.029.65

USSR

GROSHEV, I. N., FUKS, L. B., YARESHKO, Yu. P., YASHCHISHIN, P. I.

"Limiting Energy Efficiency of Microwave Scanning Radio Image Converters"

Moscow, Radiotekhnika i Elektronika, Vol 17, No 4, Apr 72, pp 894-896

Abstract: The authors consider semiconductor radio image converters in the millimeter wave band designed for obtaining images of objects in fog. The radio image of the object in the focal plane of an optical type antenna is scanned by localized control of the conductivity of a semiconductor plate which is also located in the focal plane of the antenna. An analysis of the energy efficiency of such a scanning image converter shows that the power transmission factor is equal to -20 or -30 dB or less regardless of the design of the equipment.

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Vacuum Tubes

UDC 621.385.6

USSR

NECHAYEV, V. YE., RODIONOV, V. V., EUKS, M. I.

"Linear Wave Analysis in Cylindrical Magnetron Systems Extended along an Axis"

Gor'kiy, Izvestiya Vysshikh Uchebnykh Zavedeniy--Radiofizika, Vol XIV, No 2, 1971, pp 317-322

Abstract: The problem of small oscillations of an electron flux in a magnetron has been investigated previously. It is of interest to study wave motion in magnetron systems developed in the axial direction. This paper contains an investigation of wave properties in wave guide magnetrons matched along the axis on the basis of a model with Brillouin electron flux and a longitudinally ribbed anode structure. The purpose of the linear analysis is establishment of possible forms of instability and the dependence of their domains on the system parameters. The helical waves in the Brillouin electron flux are investigated in the linear approximation. It is demonstrated that the presence of longitudinal electron velocity leads to the occurrence of a region of amplification.

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USSR

NECHAYEV, V. YE., et al, Izvestiya Vysshikh Uchebnykh Zavedeniy -- Radiofizika, Vol XIV, No 2, 1971, pp 317-322

The calculated results are illustrated by graphs of the dispersion curves for some standard values of the parameters. Processing analogous graphs for various values of the parameters makes it possible to estimate the mutual arrangement of the time instability regions of the waves (amplification and generation) as a function of the impedance of the anode structure, the proximity of the flux to the anode surface and the longitudinal electron velocity. It is noted that the results obtained are applicable to shortwave magnetron systems in which the phase lead per period of the decelerating system is appreciably less than π. The problem investigated here can be developed in the direction of studying the effect of anisotropic properties of anode structure and considering the radial gradient of the angular velocity of electrons.

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USSR

UDC 541.182.2/.3:628.511.4

KIRSH, A. A., FUKS, N. A., Physical Chemistry Scientific Research Institute imeni L. Ya. Karpov

"Pressure Drop and Aerosol Deposition in a Polydispersed Fiber Fan Model Filter"

Moscow, Kolloidnyi Zhurnal, vol 35, No 5, September-October 73, pp 971-973

Abstract: Experimental data showed that the pressure drop and efficiency of diffusion deposition of highly dispersed aerosols in fan model filters consisting of polydispersed fibers can be calculated from the arithmetic mean of the fiber radius. The fibers used in the study were 0.043- to 0.31-mm-diameter polycaprolactam; the aerosols were 0.02-μm-diameter selenium and dioctyl sebacate and were pulled through the filter at a rate of 1 to 10 cm/sec.

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Miscellaneous

UDC 542.67:546.217

USSR

KIRSH, A. A., STECHKINA, I. B., and FUKS, N. A., Physical-Chemical Institute imeni L. Ya. Karpov, Moscow

"Gas Flow in Filters Consisting of Polydispersed Ultrafine Fibers"

Moscow, Kolloidnyy Zhurnal, Vol 35, No 4, Jul-Aug 73, pp 670-675

Abstract: Resistance of filters consisting of polydispersed ultrafine fibers has been determined at a pressure range from 760 to 4 torr. A semiempirical formula has been proposed for the calculation of the resistance of these filters as a function of Knudsen number, allowing for the density of their packing, degree of the nonhomogeneity of their structure and the polydispersion of the fibers. It has been established that polydispersion of the filter fibers has no effect on the pressure drop at the filter, expressed as a function of Kn in spite of the fact that thick and fine fibers have basically different flow regimens.

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USSR UDC 541.182.2/.3

SUTUGIN, A. G., KOTTSEV, E. I., and FUKS, N. A., Physicochemical Institute imeni L. Ya. Karpov, Moscow

"Formation of Condensation Highly-Dispersed Uncoagulated Aerosols"

Moscow, Kolloidnyy Zhurnal, Vol 33, No 4, Jul-Aug 71, pp 585-591

Abstract: The authors made an experimental study of aerosol formation during the condensation of silver vapors with a low concentration under conditions corresponding to those used in calculations previously performed by them. The aerosol generator resembled the instrument of HIGUCHI and O'KONSKI. It was found that monodisperse aerosols with a low particle number concentration ($5 \cdot 10^1 - 3 \cdot 10^8$ cm^{-3}) are formed. It is suggested that the formation of such aerosols is due to heterogeneous condensation on the impurity nuclei, as well as the assumed existence of a relationship between the efficiency of the collisions of molecular aggregates with each other and with the vapor molecules and the size of these aggregates. An EVTsM-220 was used for the calculations.

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USSR

UDC: 541.182.2/3

SUTUGIN, A. G., and FUKS, N. A., Scientific Research Physicochemical Institute imeni L. YA. Karpov, Moscow, State Committee for Chemistry

"Formation of Condensation Aerosols Under Rapidly Changing External Conditions. Theory and Method of Calculation"

Moscow, Kolloidnyy Zhurnal, Vol 32, No 2, Mar-Apr 70, pp 255-260

Abstract: The article describes a method for calculating a macroscopic pattern of aerosol formation which includes the simultaneously occurring processes of nucleation, condensation growth of particles and coagulation. The method is suitable under arbitrarily rapid changes in external conditions. The general scheme of calculation is as follows: For a certain time segment there is integration of the system of nonlinear differential equations

$$\frac{df_1}{dt} = -\sum_{g=1}^{\infty} a_g K_{1g}(T) f_1 f_g + \sum_{g=3}^{\infty} \beta_g f_g$$

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SUTUGIN, A. G., and FUKS, N. A., Kolloidnyy Zhurnal, Vol 32, No 2, Mar-Apr 70, pp 255-260

$$\frac{df_g}{dt} = -\sum_{i=1}^{\infty} a_{gi} K_{ig}(T) f_g f_i + \sum_{j+k=g} a_{jk} K_{jk}(T) f_j f_i - \beta_{g+1} f_{g+1} - \beta_g f_g$$

and equations describing changes in external conditions. It is assumed that at the initial moment the concentrations of molecular aggregates are equal to equilibrium concentrations for the temperature and concentration existing at this moment. By the time a significant number of supercritical particles are formed, the calculation program is replaced by a new program containing g + n equations of form (2) and a certain number of equations of the form

USSR

SUTUGIN, A. G., and FUKS, N. A., Kolloidnyy Zhurnal, Vol 32, No 2, Mar-Apr 70, pp 255-260

$$d\bar{g}/dt = \sum_{l=1}^{g'} a_{lg} K_{lg} f_l$$

$$df_g/dt = -\sum_{k>g} K_{gk} f_g f_k$$

which describe changes in the concentration and size of particles in an isolated group. The number n can be 10-30, for example. Following completion of the first stage of calculation the distribution spectrum of supercritical particles containing more than g + n' molecules (n'< n) is partitioned into several groups or is replaced by one group of particles with averaged mass and concentration equal to the sum of concentrations of supercritical particles. But instead of concentrations of particles containing from g + n' to g + n molecules, zeroes are sent. After several integration steps a new portion of such supercritical particles is formed, their size averaged, concentration summed and one equation each of form (4) and (5) added to the system.

3/4

USSR

SUTUGIN, A. G., and FUKS, N. A., Kolloidnyy Zhurnal, Vol 32, No 2, Mar-Apr 70, pp 255-260

The suggested method was used to calculate aerosol formation in the condensation of silver vapors in an argon or helium jet escaping into cold air. A system of 126 differential equations of form (1)-(2) was numerically integrated by the Runge-Kutta method with the aid of an M-220 digital computer. The results indicate the existence of a threshold vapor concentration below which aerosol formation by spontaneous condensation is impossible. Aerosol formation from dilute vapors of low-volatile substances proceeds by the coagulation mechanism.

4/4

1/2 011 UNCLASSIFIED PROCESSING DATE--020CT70

TITLE--FORMATION OF CONDENSATION AEROSOLS UNDER RAPIDLY CHANGING ENVIRONMENTAL CONDITIONS -U-

AUTHOR-(02)-SUTUGIN, A.G., FUKS, N.A.

F

COUNTRY OF INFO--USSR

SOURCE--KOLLOIDNYY ZHURNAL, 1970, VOL 32, NR 2, PP 225-260

DATE PUBLISHED--------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--AEROSOL, DIFFERENTIAL EQUATION, PARTICLE SIZE, CONDENSATION REACTION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1990/1438 STEP NO--UR/0069/70/032/002/0255/0260

CIRC ACCESSION NO--AP0109498

UNCLASSIFIED

2/2 011 UNCLASSIFIED PROCESSING DATE--020CT70

CIRC ACCESSION NO--AP0109498

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A METHOD FOR CALCULATING VAPOR CONDENSATION IS PRESENTED. THE METHOD IS BASED ON NUMERICAL SOLUTION OF DIFFERENTIAL EQUATIONS DESCRIBING THE TIME VARIATION OF SUBCRITICAL AND NEAR CRITICAL MOLECULAR CLUSTERS CONCENTRATIONS AS WELL AS THE VARIATION IN THE SIZE OF SUPERCRITICAL PARTICLES, ALLOWING FOR THE CHANGE IN ENVIRONMENTAL CONDITIONS. THE SUGGESTED METHOD IS APPLICABLE FOR CALCULATING THE CONDENSATION OF ASSOCIATED GASES AND TAKES INTO ACCOUNT THE COAGULATION OF GROWING PARTICLES. THE AEROSOL FORMATION IN THE CASE OF DILUTION OF HOT GAS JETS CONTAINING SILVER VAPORS WITH COLD AIR HAS BEEN CALCULATED BY MEANS OF A COMPUTER AND THIS PROCESS HAS BEEN SHOWN TO PROCEED BY THE COAGULATION MECHANISM.

UNCLASSIFIED

1/2 011 UNCLASSIFIED PROCESSING DATE--23OCT70

TITLE--EFFECT OF INERTIA ON THE CAPTURE COEFFICIENT OF AEROSOL PARTICLES ON CYLINDERS AT LOW STOKES NUMBERS -U-

AUTHOR-(03)-STECHKINA, I.B., KIRSH, A.A., FUKS, N.A.

COUNTRY OF INFO--USSR

SOURCE--KOLLOIDNYY ZHURNAL, 1970, VOL 32, NR 3 PP 467

DATE PUBLISHED-------70

SUBJECT AREAS--PHYSICS, CHEMISTRY

TOPIC TAGS--AEROSOL, PARTICLE CAPTURE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1999/0415 STEP NO--UR/0069/70/032/003/0467/0467

CIRC ACCESSION NO--AP0122595

UNCLASSIFIED

2/2 011 UNCLASSIFIED PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0122595

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. AS SHOWN BY CALCULATIONS, AT VERY LOW STOKES NUMBERS INERTIA DOES NOT INCREASE (AS IS USUALLY BELIEVED), BUT RATHER DECREASES THE CAPTURE COEFFICIENT OF AEROSOL PARTICLES OF FINITE SIZE ON A CYLINDER ORIENTED NORMAL TO THE FLOW. FACILITY: FIZIKO-KHIMICHESKIY INSTITUT IM. L. YA. KARPOVA MOSCOW.

UNCLASSIFIED

Aerosols

USSR UDC 541.182/3:542.67

STECHKINA, I. B., KIRSH, A. A., and FUKS, N. A., Scientific Research Physico-Chemical Institute imeni L. Ya. Karpov, Moscow, State Committee for Chemistry

"Effect of Inertia on the Coefficient of Capture of Aerosol Particles on Cylinders at Low Stokes Numbers"

Moscow, Kolloidnyy Zhurnal, Vol 32, No 3, May-Jun 1970, p 467

Abstract: In previous work by the authors (Kolloidn. Zh., 31, 121, 1969 - see also S. V. Dawson, Transactions of the 9th AEC Cleaning Conference, Boston, Sep 66, p 647) the conclusion was reached that inertia under all conditions increases the coefficient of capture of aerosol particles on cylinders oriented in a direction normal to the flow of the particles. Subsequent calculations showed that this conclusion is not correct; at low Stokes numbers, inertia reduces rather than increases the coefficient of capture. This is due to the fact that inertial displacement of particles in the line of flow during approach to the cylinder increases capture, whereas inertial displacement away from the cylinder after the flow has passed around it has the opposite effect. The result obtained is

1/2

STECHKINA, I. B., et al, Kolloidnyy Zhurnal, Vol 32, No 3, May-Jun 1970, p 467

of purely theoretical value, because it applies only to particles with Stokes numbers which are so small that the effect of inertia can be disregarded.

2/2

1/2 034 UNCLASSIFIED PROCESSING DATE--30OCT70

TITLE--HEAT AND MASS TRANSFER DURING THE CONDENSATION OF PURE STEAM AND STEAM CONTAINING ADDED AIR ON A TUBE BUNDLE INSIDE FLOW -U-

AUTHOR-(02)-FUKS, S.N., ZERNOVA, E.P.

COUNTRY OF INFO--USSR

SOURCE--TEPLOENERGETIKA 1970, 17(3), 59-63

DATE PUBLISHED--------70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--HEAT TRANSFER, MASS TRANSFER, VAPOR CONDENSATION, HEAT EXCHANGER

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1989/0936 STEP NO--UR/0096/70/017/003/0059/0063

CIRC ACCESSION NO--AP0107465

UNCLASSIFIED

2/2 034 UNCLASSIFIED PROCESSING DATE--30OCT70
CIRC ACCESSION NO--AP0107465
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A HEAT EXCHANGER, A BUNDLE OF 56-19 MM OUTSIDE DIAM. BRASS TUBES, WAS USED ALTERNATELY IN DOWNFLOW (A) AND CROSSFLOW (B) STEAM CONDENSATION STUDIES. A HIGH PURITY STEAM, CONTG. 0.0005 KG AIR-KG STEAM, AND STEAM WITH SMALLER THAN OR EQUAL TO 50PERCENT AIR WERE USED IN HEAT AND MASS TRANSFER STUDIES AT REYNOLDS NOX. 332-5000 AND TEMP. DRIVING FORCES OF 3.7-19.2DEGREES. MASS TRANSFER RATES WERE 40 AND 55PERCENT HIGHER ON THE TUBE ROW 1 THAN ON TUBE ROWS 2 AND 3, RESP.; THE MASS TRANSFER WAS THE SAME IN BOTH MODES OF STEAM FLOW. HEAT TRANSFER IN A AND B MODES OF FLOW WAS THE SAME; THE COEFF. DECREASED SHARPLY AS THE AIR CONTENT OF THE STEAM INCREASED. THE RESULTS PROVED THAT HEAT AND MASS TRANSFER EQUATIONS DEVELOPED FOR CONDENSING STEAM CONTG. DIFFERENT AMTS. OF INERT GASES MAY BE USED IN THE DESIGN OF HEAT EXCHANGERS USING ANY MODE OF STEAM FLOW.
FACILITY: VSES. TEPOLTEKH. INST., MOSCOW, USSR.

UNCLASSIFIED

FUKS, Yu. G.

AA0052570

UR 0482

Soviet Inventions Illustrated, Section III Mechanical and General, Derwent, 2-70

243566 COATING TEXTILES with a film which imparts waterproofness, flame resistance and other properties while retaining satisfactory air permeability. The fabric is initially metallised so that the protective coating can be applied in an electrostatic field without raising the nap; it also makes the fabric repellant to radioactive and heat rays. After coating, the fabric is dried on cylinders with suction units on the back of the fabric. This ensures good coating adhesion and removes the film from the interstices between the threads to allow good air permeability. 4.9.67. as 1181781/28-12. F.L.AL'TER-PESOTSKII. Iu.G.FUKS. Bast Fibres Res. Inst. (29.9.69.) Bul.17/14.5.69. Class 8a. Int.Cl. B05c.

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19821256

AA0052570

Al'ter-Pesotskiy, F. L.; Fuks, Yu. G.
Tsentral'nyy Nauchno--Issledovatel'skiy Institut Lubyanykh Volokon

19821257

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UDC 519.281

USSR

F

FUKS-RABINOVICH, M. S.

"Application of a Method of Stochastic Approximations to the Evaluation of the Parameters of Prognostic Equations"

Tr. gidrometeorol. n.-i tsentr. SSSR (Works of the Hydrometeorological Scientific Research Institute SSSR), 1970, No 54, pp 81-85 (from RZh-Matematika, No 6, Jun 70, Abstract No 6V186)

Translation: Several parameters having both a physical and mathematical nature enter into a system of prognostic equations. The results of calculations depend considerably on the accuracy of assigning these parameters. A determination of these parameters a priori is often complicated, since they can be closely associated with the character of the prognostic fields. The method of stochastic approximations can be applied to evaluate the unknown parameters of the system of prognostic equations. This method makes it possible to obtain values of the parameters that are optimal in a certain sense on the basis of a large number of events. In this paper the application of the method is considered in the example of a vortex equation taking into account the diffusion term and considering the viscosity coefficient as the unknown parameter. An unbiased evaluation of the

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FUKS-RABINOVICH, M. S., Tr. gidrometeorol. n.-i. tsentr. SSSR (Works of the Hydrometeorological Scientific Research Institute SSSR), 1970, No 54, pp 81-85 (from RZh-Matematika, No 6, Jun 70, Abstract No 6V186)

desired parameter, reducing to the true value of this parameter with probability one, is obtained using the algorithm of stochastic approximation. The method can be applied to evaluate different parameters entering into a system of prognostic equations.

Author's abstract

2/2

USSR UDC 536.5.082.6(038.8)

ARANOVICH, R. M., VYATICH, L. A., FUKS-RABINOVICH, S. I., ALEKSEYEV, V. YA.

"Non-Contact Temperature Measurement of the Surfaces of Heated Objects"

USSR Author's Certificate No 250500, filed 28 Feb 66, published 12 Jan 70 (from RZh-Metrologiya i Izmeritel'naya Tekhnika, No 8, Aug 70, Abstract No 8.32.569 P)

Translation: A method of non-contact measuring of the temperature of surfaces of heated objects by means of scanning the thermal image of the object on the screen of a cathode ray tube and its analysis is patented. In order to raise the accuracy of measurement, two standard control heaters are introduced into the field of vision, the radiation intensity of one of them and a selected point on the image line are equalized and using this value as the known level of measurement and the known difference in radiation intensity of standard heaters as the temperature scale. The measured temperature is judged according to the corresponding voltage curve on the recording instrument.

V. S. K.

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USSR

UDC 8.74

FUKSMAN, A. L.

"System for Planning and Designing SPT-RGU Translators"

V sb. Teoriya yazykov i metody postroyeniya sistem programmir. (Language Theory and Methods of Constructing Programming Systems--collection of works), Kiev-Alushta, 1972, pp 173-180 (from RZh-Kibernetika, No 12, Dec 72, Abstract No 12V456)

Translation: A system for designing translators developed at the Rostov-na-Donu University Computation Center (SPT-RGU) is described. The SPT-RGU can be represented as comprising two parts: the procedural section and the programming section. The procedural section encompasses the following aspects of planning: the general organization of translation with isolation of the scans realizing syntactically orienting processing of the text; organization of the syntactically oriented processing of the text on the basis of representation of the syntax of the input language by a weakly separated grammar with the application of series objects; the language for recording the grammar and the relation of the syntax to the translating programs called transducers; methods of including the grammer transforming it into a text processing pseudo-program executed by a special interpreter (the control algorithm); a procedure for supplementing the syntax by special rules insuring continuation of the

USSR

FUKSMAN, A. L., Teoriya yazykov i metody postroyeniya sistem programmir., Kiev-Alushta, 1972, pp 173-180

analysis after detection of the syntactic error; an output procedure during the process of translating reports on the syntactic and semantic errors; intermediate languages used for the organization of several scans; organization of input-output during the translation process; organization of the coordinate system of the input text and its projection. The programming part is subdivided into the all-purpose part and the auxiliary part. The all-purpose part comprises a series of programs written in the base language with an insignificant addition of machine codes. They include the following: the control algorithm program including fragments realizing a continuation of the translation when detecting errors and outputting reports on the syntactic errors; the K-translator program which translates the recording of the grammar in the K-language with inclusion of the transducer in the pseudoprogram; the semantic error message output module; the input text corrector; the standard transducer program library (for example, for processing names, numbers, and so on). All the cases of application of machine codes in these programs are localized in the form of procedures. The auxiliary part is written in machine codes and comprises subprograms realizing input-output and operation with parts of cells.
2/2

USSR

UDC 8.74

FUKSMAN, A. L.

"General Organization of the Translator"

V sb. Razrabotka translyatorov (Development of Translators--collection of works), Rostov-na-Donu, Rostov University, 1972, pp 7-17 (from RZh-Kibernetika, No 12, Dec 72, Abstract No 12V458)

Translation: A study was made of the general structure of a translator from the point of view of its functioning. Its basic modules are analyzed. Attention is given to the maintenance service and localization of errors. It was found that for the corresponding organization of the translator a significant part of its modules can be made little-dependent on the input language, the specific computer or one or the other together.

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UDC 8.74

USSR

FUKSMAN, A. L.

"Organization of Input-Output in a Translator"

V sb. Razrabotka translyatorov (Development of Translators--collection of works), Rostov-na-Donu, Rostov University, 1972, pp 108-116 (from RZh-Kibernetika, No 12, Dec 72, Abstract No 12V460)

Translation: An input-output system is constructed on the basis of standardized standard routines reference to which does not depend on the specific machine and operations system. When using this input-output system, the tedious operations of the systems programmers with respect to organizing the input-output in the translators is reduced.

The implementation of the system is based on the so-called information flow providing for information input and output both by one symbol and by a file.

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USSR

UDC 8.74

FUKSMAN, A. L.

"Text Processing on the Basis of Shared Syntax"

V sb. Razrabotka translyatorov (Development of Translators--collection of works), Rostov-na-Donu, Rostov University, 1972, pp 18-57 (from RZh-Kibernetika, No 12, Dec 72, Abstract No 12V459)

Translation: A study was made of syntactically oriented text processing using the so-called control algorithm which is distinguished by high speed as a result of applying special types of grammars which eliminate impasses in the analysis. The concept of the text processing plan relating the syntactic analysis and the semantic processing of the input text is introduced.

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USSR

UDC 620.193.5

ZELENSKIY, V. F., PETEL'GUZOV, I. A., and FULIMOV, N. A., Academy of Sciences UKrSSR, Khar'kov Physico Technical Institute

"Oxidation of Magnesium and Metal Ceramic Mg-Be Alloys in Carbon Dioxide at 60 atm"

Moscow, Zashchita Metallov, Vol 7, No 2, Mar-Apr 71, pp 132-136

Abstract: The oxidation resistance of magnesium and its metal ceramic alloys with beryllium (0.5-5% Be) is studied in carbon dioxide gas with varying moisture content at 60 atm pressure and 470-580° temperature. In carbon dioxide gas containing over 0.5-1.0% H_2O, the magnesium and Mg-Be alloys are damaged by intercrystalline and intracrystalline oxidation and an increase in size resulting from penetration of hydrogen into the structure of the metal or alloy. Sublayers of metals which absorb hydrogen intensively increase the oxidation resistance of magnesium and Mg-Be alloys in moist CO_2. Type MG-1 magnesium is oxidation resistant up to 580° for over 1,000 hours in carbon dioxide gas with moisture content 0.001-0.01% at pressures of up to 60 atm. Increasing the moisture content over 0.2% causes intercrystalline

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USSR

ZELENSKIY, V. F., et al., Zashchita Metallov, Vol 7, No 2, Mar-Apr 71, pp 132-136

and intracrystalline oxidation. Mg-Be alloys resist oxidation for crystalline and intracrystalline oxidation. Mg-Be alloys resist oxidation for over 10,000 hours in carbon dioxide containing 0.1-0.2% H_2O under the same conditions. Moisture contents of 2% and more cause the formation of a rough, flaking scale on the alloys.

2/2

AA0040756 FULMAKHT V.V. UR 0482

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3/70

Soviet Inventions Illustrated, Section I Chemical, Derwent,

234624 MOULD LUBRICATOR FOR CONTINUOUS CASTING PLANTS uses feed channels which issue above the collector so as to ensure even distribution of lubricant round the mould perimeter, Lubricant is pumped etc. from tank 1 to the frame 2 on the mould 3 and via a feedline 4 with choke 5. It thus reaches the collector 7 and as this fills so the lubricant fills all the channels 8. When there is excess lubricant pressure in the collector, the lubricant is fed in identical portions into all these channels and thus flows out at the mould perimeter in identical portions. 7.10.65. as 1031428/22-2. EVTEEV D.P et al. Metallurgical Plant Design Inst. (26.6.69.) Bul.4/10.1.69. Class 31c. Int.Cl. B22d.

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18

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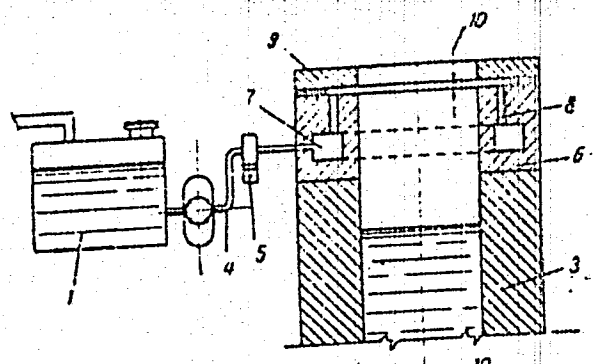
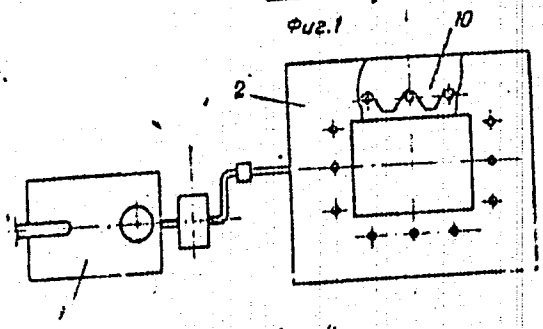
AA0040756



Фиг.1



Фиг. 2

19750440

AA0040756

AUTHORS: Yevteyev, D. P.; Zhidovinova, M. M.; Karpeka, V. A.; Kaushanskiy, A. S.; Krulevetskiy, S. A.; Pravdin, V. S.; Satanovskiy, Ya. Ye.; Ful'makht, V. V.; Shabanov, A. N.

Gosudarstvennyy Soyuznyy Institut po Proyektirovaniyu Metallurgicheskikh Zavodov

19750441

3/3

USSR

UDC 621.372.8

BEZRODNYY, V. G., FUNS, I. M., Institute of Radio Physics and Electronics of the Ukrainian SSR Academy of Sciences

"Time-Space Correlation of the Field Amplitude and Phase in a Wave Guide with a Statistically Uneven Boundary"

Gor'kiy, Izvestiya vysshikh uchebnykh zavedeniy, Radiofizika, Vol XV, No 1, 1972, pp 73-82

Abstract: The method of perturbation theory in the Born approximation was used to solve the problem of space-time correlation of the field amplitude and phase in a flat waveguide with a statistically uneven wall. It is proposed that the height of the boundary unevennesses is low by comparison with the wavelength and $|x_n l_{x,y}| \gg 1$, $|\Delta x l_x| \gg 1$, $l_y \gg \sqrt{D/|x_n|}$ (l_x and l_y are the correlation radii of the unevennesses along and transverse to the propagation path, respectively, D is the path length, x_n is the longitudinal wave number of the n-th normal wave, $\Delta x \sim |x_n - x_{n-1}|$), and variation in the shape of the boundary with time takes place appreciably more slowly than the period of the electromagnetic oscillations. The space-time correlation coefficient has identical form for the field amplitude and phase. It does not depend on the specific

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USSR

BEZRODNYY, V. G., et al., Izvestiya vysshikh uchevnykh zavedeniy, Radiofizika, Vol XV, No 1, 1972, pp 73-82

model of the wave guide and it is determined only by the statistical characteristics of the boundary unevennesses. The expressions for the dispersions of the amplitude and phase fluctuations, their spatial correlation functions and time spectra are analyzed in a number of limiting cases.

USSR UDC 617-001.28-06:617-001.4-021.6-092.9-036.8:616.419

STANKEVICH, N. V., and FUNSHTEYN, L. V., Deceased, Laboratory of Pathological Anatomy, Central Scientific Research Institute of Roentgenology and Radiography, Ministry of Health USSR, Leningrad

"The Effect of Screening an Area of Bone Marrow on Hematopoiesis and Survival Rate of Irradiated Animals"

Moscow, Byulleten' Eksperimental'noy Biologii i Meditsiny, No 7, 1971, pp 110-114

Abstract: A portion of the stomach wall was excised from 53 cats 25 hours (latent period) or 7 days (height of radiation sickness) after whole-body irradiation (208 r) with screening of one of the animals' hind legs with a lead shield. Screening of bone marrow markedly increased the survival rate and life-span of experimental cats, especially if the operation was performed during the latent period of radiation sickness. Moreover, changes in blood morphology were less pronounced in the screened animals. Another favorable effect of screening was manifested by the fact that the postoperative stomach wound healed at the same rate as in the control (operated but not irradiated) animals.

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42 013 UNCLASSIFIED PROCESSING DATE--27NOV70

TLE--ANOMALOUS ANGULAR DISTRIBUTION OF FRAGMENTS FROM THE FISSION OF RADIUM BY 14-16 MEV NEUTRONS -U-

UTHOR-(05)-BABENKO, YU.A., NEMILOV, YU.A., PLESKACHEVSKIY, L.A., SELITSKIY, YU.A., FUNSHTEYN, V.B.

OUNTRY OF INFO--USSR

OURCE--YAD. FIZ. 1970, 11(5), 1006-11

ATE PUBLISHED--------70

UBJECT AREAS--PHYSICS, NUCLEAR SCIENCE AND TECHNOLOGY

OPIC TAGS--ANGULAR DISTRIBUTION, NUCLEAR FISSION, RADIUM ISOTOPE

ONTROL MARKING--NO RESTRICTIONS

OCUMENT CLASS--UNCLASSIFIED
ROXY REEL/FRAME--3008/0577 STEP NO--UR/0367/70/011/005/1006/1011

IRC ACCESSION NO--AP0137662

UNCLASSIFIED

2/2 013 UNCLASSIFIED PROCESSING DATE--27NOV70

IRC ACCESSION NO--AP0137662

BSTRACT/EXTRACT--(U) GP-0- ABSTRACT. FRAGMENT ANGULAR DISTRIBUTIONS FOR THE FISSION OF PRIME226 RA BY N WITH ENERGIES 12.6-19.5 MEV WERE MEASURED. AS THE SOURCE OF N, THE REACTIONS (D(D,N) PRIME3 HE AND T(D,N) PRIME4 HE WERE USED. THE ANOMALOUS SHAPE OF THE DISTRIBUTION, MANIFESTING ITSELF AS A FRAGMENT YIELD AT AN ANGLE OF SIMILAR TO 60DEGREES AT E SUBN EQUALS 14.6-15.6 MEV, IS EXPLAINED AS DUE TO THE "CHANNEL" STRUCTURE OF THE FISSION BARRIER OF THE PRIME226 RA NUCLEI PRODUCED FROM PRIME 227 RA AFTER EVAPG. 2 N. THE FISSION BARRIER OF PRIME226 RA IS 7.0 PLUS OR MINUS 0.5 MEV. THE TOTAL CROSS SECTION VARIES SLIGHTLY FROM 21 TO 33 MB IN THE ENERGY INTERVAL E SUBN EQUALS 15.6-19 MEV. EXPTS. PERFORMED ON PRIME233 U GAVE A NEG. ANSWER TO THE QUESTION OF THE EXISTENCE OF ANOMALOUS ANGULAR DISTRIBUTIONS FOR FISSION OF OTHER NUCLEI.

UNCLASSIFIED

UDC 621.373.826:550.3

USSR

RYADOV, V. Ya. and FURASHOV, N. I.

"Investigating the Absorption in Atmospheric Windows Transparent to Waves of 0.3-0.5 mm"

Moscow, V sb. X Vses. konf. po rasprostr. radiovoln. Tezisy dokl. (Tenth All-Union Conference on the Propagation of Radio Waves; Report Theses--collection of works) "Nauka," 1972, pp 48-51 (from RZh--Radiotekhnika, No 10, 1972, Abstract No 10D358)

Translation: Results are reported of atmospheric absorption measurements in windows transparent to $\lambda \simeq 0.32$, 0.35, 0.45, and 0.49 mm, under field conditions, through the method of humidity variation. The presence of singularities of absorption close to $1/\lambda = 22$ cm^{-1} is established. The theoretical computations show that such a singularity may belong either to dimer spectra or to a rotating monomer spectrum in an excited oscillatory state. Two illustrations, one table, bibliography of 10, A. L.

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UDC: 621.371.166.2

USSR

RYADOV, V. Ya. and FURASHOV, N. I.

"Investigating the Absorption Spectrum of Radio Waves by Atmospheric Water Vapor in the 1.15-1.5 mm Range"

Gor'kiy, Izvestiya VUZ--Radiofizika, No 10, 1972, pp 1469-1474

Abstract: The portion of the spectrum ranging from 1.0 to 1.5 mm corresponds to a highly transparent atmospheric window, and its investigation is therefore important to transmissions at this wavelength as well as to perfecting the theory of microwave radiation in the atmosphere. This paper gives the results of a detailed quantitative investigation into the absorption spectrum of water vapor in the air in the 1.15-1.55 mm range. The measurements were made under field conditions by the method of varying humidity over a transmission distance of 2.94 km through the use of a reflected beam; the length of the direct and reflected beams were about 1.5 km with an angle of about 0.5° between them. A flat metal mirror with a diameter of 700 mm and capable of rotation was responsible for the reflection, and the plane of the direct and reflected beams was about 2-3 meters above the ground level. The radiation source was a backward-wave tube with an output power of 100-300 mW.

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USSR

RYADOV, V. Ya., et al, Izvestiya VUZ--Radiofizika, No 10, 1972, pp 1469-1474

Curves of the absorption as a function of the wavelength show its values to be about twice as high as those computed for H_2O monomers, and show also that the experimentally obtained distribution of the water vapor absorption with respect to the wavelength offers no evidence of the peculiarities alleged by earlier investigators. A curve for the absorption coefficient of the water vapor as a function of the water vapor concentration for the center atmospheric window wavelength of 1.4 mm is also plotted. The authors thank P. P. Prygunov, A. I. Khvostova, A. V. Poverov, and V. F. Vasil'yev for their assistance with the measurements, and to M. V. Zinicheva for her computations on the computer as well as to S. A. Zhevakin for his comments on the measurement results.

2/2

USSR

UDC: 621.371.166.2

RYADOV, V. Ya. and FURASHOV, N. I.

"Investigating the Radio Wave Absorption in the Atmospheric Window Transparent to $\lambda = 0.73$ mm"

Gor'kiy, Izvestiya VUZ--Radiotekhnika, No 10, 1972, pp 1475-1485

Abstract: A description is given of absorption measurements of radio waves in the range of 0.71 to 0.76 mm, the first time such measurements have been made in this range with a source of monochromatic radiation and over a large distance. The purpose of these experiments was to verify and improve the precision of measurement data already available for the transparency of the atmosphere for wavelengths of 0.73 mm. The transmissions were made with a backward wave tube of 2-5 mW output power. The antenna consisted of a parabolic mirror with a 900 mm diameter and an elliptical reflector 100 mm in diameter, the connection between the BWT oscillator and the antenna being realized by a waveguide of 1.2×2.4 mm^2 cross section and a pyramidal horn. The horn output was modulated at a frequency of 10 Hz. A diagram is given together with curves comparing theoretical data with those obtained

1/2

USSR

RYADOV, V. Ya., et al, Izvestiya VUZ--Radiotekhnika, No 10, 1972, pp 1475-1485

by the present experiments. The authors thank A. V. Povarov and N. I. Shashkin for their help with the measurements, M. B. Zinicheva for her calculations on the electronic computer, and S. A. Zhevakin for his comments.

2/2

UDC 621.317.1

USSR

RYADOV, V. Ya. and FURASHOV, N. I.

"Measuring the Absorption Coefficient of Atmospheric Water Vapor in the Region of Resonance for the Line $\lambda = 0.398$ mm"

Moscow, V sb. X Vses. konf. po rasprostr. radiovoln. Tezisy dokl. (Tenth All-Union Conference on the Propagation of Radio Waves; Report Theses--collection of works) "Nauka," 1972, pp 57-60 (from RZh--Radiotekhnika, No 10, 1972, Abstract No 10A472)

Translation: The equipment and method of measuring the absorption coefficient of water vapor in the region of the 0.398 mm line corresponding to the rotatory transition $2_2 - 2_0$ are described. The width and intensity of this line were measured directly from its contour. During the measurement process, the absolute humidity of the air varied in the interval 2-15 g/m^3. A. K.

1/1